REMARKS

Claims 1-60 are pending in the application. Claims 9, 12,-24, 34, 42-47 and 52-55 have been withdrawn from consideration. Claims 1-24, 33-55 and 60 have been canceled without prejudice or disclaimer. Claims 25 and 31 have been amended, new claims 61-64 have been added. No new matter has been added. Reconsideration of the claims is respectfully requested.

Drawings

FIG. 3 was objected to for failing to have a legend "Prior Art". An amended version of FIG. 3 containing such a legend is submitted along with this response. Applicants respectfully request that the objection be withdrawn.

Specification

The Specification was objected to for referring to US Application Serial No. 09/181,145. This has been changed by amendment to U.S. Patent No. 6,829,152. Applicants respectfully request that the objection be withdrawn.

Claim Objections

Claims 1, 11 and 31 are objected to. Claims 1 and 11 have been canceled. Claim 31 has been amended as suggested in the Office Action. This amendment was not made for reasons of patentability, nor does it narrow the scope of the claim.

Rejections under 35 U.S.C. § 102

Claims 1-8, 10, 11, 25-33, 35-41, 48-51 and 56-60 are rejected under 35 U.S.C. §102 (b) as being anticipated by Huang et al. (U.S. Patent 6,282,025) (Huang). Huang teaches various versions of an optical polarization beam combiner/splitter that use Wollaston prisms. In the embodiment illustrated in FIG. 4, collimated light (50) from a lens passes into a birefringent walk-off crystal (52), where it is split into two beams of (54 and 56) of orthogonal polarization (col. 5, lines 30-47). After exiting the crystal, the separated beams enter a Wollaston prism (60), which bends the propagation directions

of the beams so that they may be focussed by the lens (62) such that they enter the optical fibers (64 and 66), respectively, in a ferrule (68).

In the embodiment illustrated in FIG. 5, collimated light (80) from a lens (78) passes into a first Wollaston prism (82), which splits the light along two beam paths (84 and 86) (col. 6, lines 12-25). After exiting the first Wollaston prism, the beams enter a second Wollaston prism (88), which bends the propagation directions of the beams (84 and 86) towards each other so that they may be focussed by the lens (90) such that they enter the optical fibers (92 and 94) (col. 6, lines 26-38).

In the embodiment illustrated in FIG. 6, a diverging optical beam (106) from a fiber (102) is brought to a focus inside a Wollaston prism (110) by a lens (108). Two diverging beams (114 and 116) are produced by the Wollaston prism. The diverging beams leave the Wollaston prism at two different angles symmetrical about the optical axis (112). The lens (118) focuses the two beams such that they enter respective optical fibers (120 and 122) disposed symmetrically about the optical axis.

The invention of amended claim 25 is directed to an optical device that has a first waveguide and a second waveguide coupled to the first waveguide via a first bi-directional, polarization dependent path. A third waveguide is coupled to the first waveguide via a second bi-directional, polarization dependent path. A single Wollaston prism is disposed on the first and second bi-directional, polarization dependent paths, the first and second bi-directional, polarization dependent paths overlapping between the first waveguide and the Wollaston prism. A first converging optical subsystem is disposed to couple light between the second waveguide and the Wollaston prism and between the third waveguide and the Wollaston prism. The first converging optical subsystem includes at least one focusing element common to the first and the second bi-directional, polarization dependent paths. The first and second paths are substantially collimated between the Wollaston prism and the first converging optical subsystem.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Therefore, all claim elements, and their limitations, must be found in the prior art reference to maintain a rejection based on 35 U.S.C. §102. Applicants respectfully submit that Huang does not teach every element of claim 25, and therefore fails to anticipate claim 25.

In the embodiment illustrated in FIG. 4, the optical paths do not overlap between the first waveguide and the Wollaston prism. Instead, the optical paths only overlap between the first waveguide and the walk-off crystal. The walk-off crystal splits the light into two beams. The Wollaston prism is used only for bending the beams, not for splitting the beams.

In contrast to the embodiment illustrated in FIG. 4, the invention of claim 25 has the first and second paths overlapping between the first waveguide and the Wollaston prism, which splits the light along the two paths. Accordingly, the embodiment in FIG. 4 fails to show all the elements of the claim.

In the embodiment illustrated in FIG. 5, the walk-off crystal is replaced with a second Wollaston prism. There are, therefore, two Wollaston prisms between the first and second waveguides. In contrast, the invention of claim 25 is directed to a single Wollaston prism between the two waveguides. Accordingly, the embodiment of FIG. 5 fails to show all the elements of the claim.

In the embodiment illustrated in FIG. 6, only a single Wollaston prism is used. Furthermore, there is a single beam passing from the first waveguide to the single Wollaston prism. However, the beam passing into the Wollaston prism is specifically taught as being a converging beam that focuses in the Wollaston prism, and the resulting two beams propagating from the Wollaston prism are diverging beams.

In contrast, in the invention of claim 25, only a single Wollaston prism is used but, between the Wollaston prism and the first converging optical system, which is between the Wollaston prism and the second and third waveguides, the optical paths are collimated, not diverging. Accordingly, the embodiment of Fig. 6 does not show all the elements of claim 25.

Since Huang fails to show all the elements of claim 25, this claim is not anticipated by the prior art, and is allowable.

In the method of independent claim 56, light is coupled between a first waveguide and second and third waveguides. The method includes propagating the light along bi-directional, polarization-dependent free-space paths including propagating polarized light along a first path between the first and second waveguides and propagating polarized light, polarized orthogonally relative to light propagating along the first path, along a second path between the first and third waveguides. The light on the first and second paths is collimated. The first and second paths are spatially separated and bent where the paths are collimated using a single Wollaston prism.

As has been discussed above, none of the embodiments in Huang show a single Wollaston prism being used to spatially separate beams of orthogonal polarization between waveguides, where the light is collimated going through the Wollaston prism. Accordingly, Huang fails to teach all the elements of this claim, and claim 56 is allowable.

Dependent claims 26-32 and 57-59, which depend from independent claims 25 and 56, were also rejected under 35 U.S.C. §102(b) as being unpatentable over Huang. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made in connection with independent claims 25 and 56. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited references. Therefore, dependent claims 26-32 and 57-59 are also in condition for allowance.

New dependent claims 61-64 have been added to depend, directly or indirectly, from claim 25.

Conclusion

In view of the amendments and reasons provided above, it is believed that all pending claims are in condition for allowance. Applicants respectfully request favorable reconsideration and early allowance of all pending claims.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' attorney of record, Iain A. McIntyre at 952-253-4110.

Respectfully submitted,

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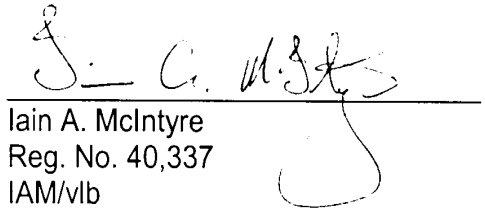
By: 

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